



## Redescription of the Australian metallic-green tomato fly, *Lamprolonchaea brouniana* (Bezzi) (Diptera: Lonchaeidae), with notes on the Australian *Lamprolonchaea* fauna

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### Abstract

The twenty-four species of Lonchaeidae (lance flies) known from Australia commonly breed in a wide variety of organic matter, including fruit and vegetables. The metallic-green tomato fly (*Lamprolonchaea brouniana*) is the best known species, being an agricultural pest. However its common name is also applied to other similar bright metallic golden-green lance flies. Australian lance flies are generally relatively poorly understood taxonomically, with few species descriptions including (1) both male and female adults, (2) detailed descriptions of larval diagnostic morphological characters, and (3) molecular characterisation of the barcoding COI mitochondrial DNA region (no lance flies having been sequenced to date). The latter two could provide valuable tools to assist in identifying this species from larvae found in food produce, the most common life stage encountered, which are currently sometimes confused with economically important tephritid fruit fly larvae. In the current study we redescribe the morphological characteristics of adults, larvae and pupae as well as characterise the COI gene from the most common Australian lonchaeid fruit pest, *L. brouniana*, to enable an accurate species diagnosis. We provide a key to known Australian *Lamprolonchaea* species, and clarify the taxonomy of *L. brouniana*, including designating type material. This species appears to be restricted to Australia, and has been most commonly collected from the temperate south. Life history characteristics, including the timing of occurrence and host plant use, were also examined. Over the last decade south-eastern Australian larval samples were found over the warmer summer and autumn months from various fruit, most often (>70%) from tomato fruit, and not normally in association with other serious primary pests, such as Queensland Fruit Fly (*Bactrocera tryoni*).

**Key words:** Diptera: Lonchaeidae, Australia, pest of fruit, larval morphology, DNA barcoding, metallic-green tomato fly

### Introduction

Over 500 species of Lonchaeidae (lance flies) have been described, in nine genera, from most forested regions of the world apart from New Zealand (Ferrar 1987). Almost sixty new species have been described in recent years from Asia / Middle East (MacGowan 2004, 2005b, 2006, 2007, 2008a), Africa (MacGowan 2005a) and Europe (MacGowan 2008b, 2009), however the taxonomy of Australian lonchaeid flies has not been recently reassessed, with the last new species being described thirty-five years ago (McAlpine 1975). In Australia there are currently twenty-four species recognised in four genera—*Lonchaea* Fallén, *Lamprolonchaea* Bezzi, *Silba* Macquart and *Dasiops* Rondani (Pitkin 1996), however taxonomically they are relatively poorly known with very few species descriptions including both male and female adults, and no detailed descriptions of larval stages.

Most of the twenty species of *Lamprolonchaea* occur exclusively in the Pacific / Australasian region and are rather similar morphologically, with golden-green or blue shining metallic bodies (McAlpine & Steyskal 1982, MacGowan 2005a), and species identification is generally dependant on the examination of the male genitalia (McAlpine 1964, MacGowan 2005a). However the metallic-green tomato fly, *Lamprolonchaea brouniana* Bezzi (1919), one of the most common species of lance fly in Australia (Colless & McAlpine 1991), possesses a distinctive pitted frons, which assists in distinguishing this species from other members of